



SEMITRANS™ 3

Ultrafast IGBT Modules

SKM 800GA125D

Target Data

Features

- Homogeneous Si
- NPT-IGBT
- $V_{CE(sat)}$ with positive temperature coefficient
- High short circuit capability, self limiting to $6 \times I_C$

Typical Applications

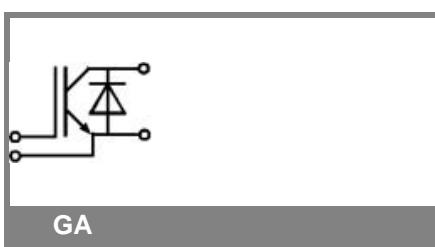
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at $f_{sw} > 20$ kHz

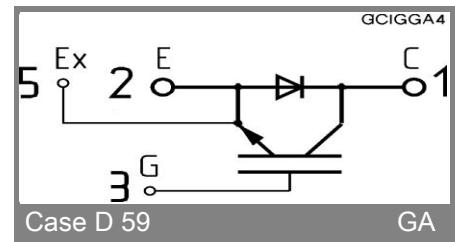
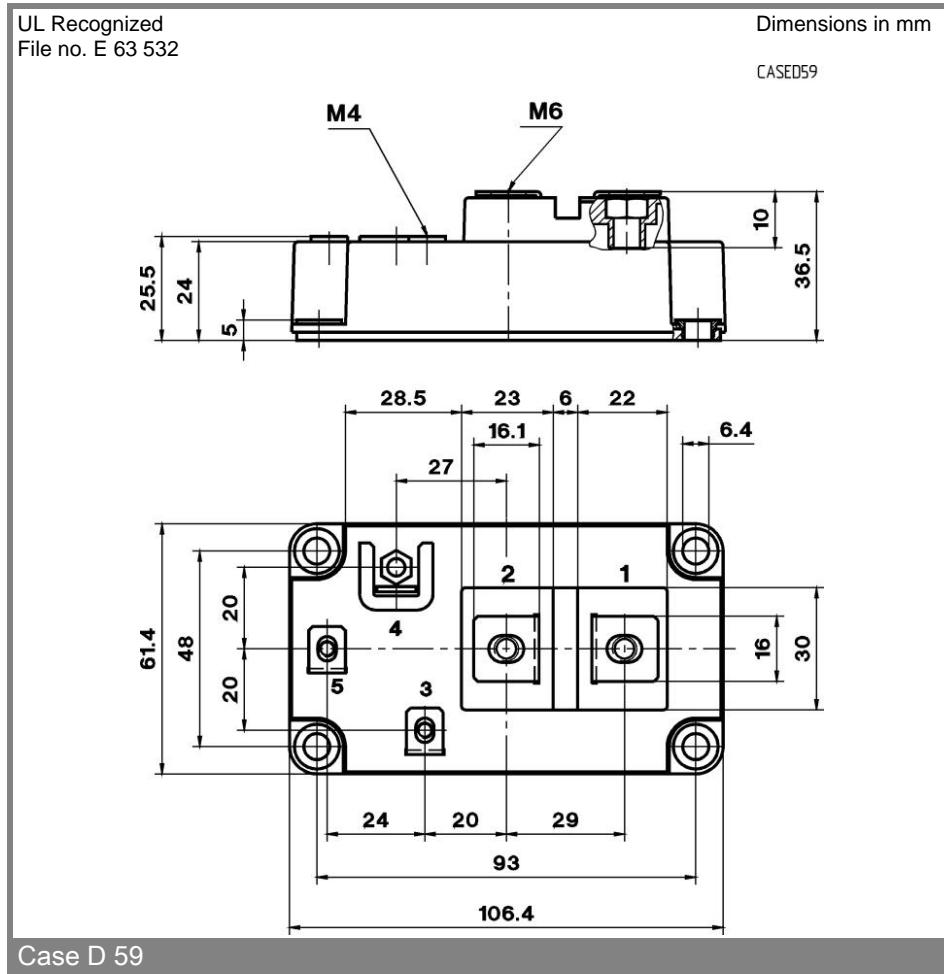
Remarks

- $I_{DC} \leq 500$ A limited by terminals
- Take care of over-voltage caused by stray inductances

Absolute Maximum Ratings		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	Values		Units
IGBT				
V_{CES}		1200		V
I_C	$T_c = 25 (80)^\circ\text{C}$	760 (530)		A
I_{CRM}	$T_c = 25 (80)^\circ\text{C}$, $t_p = 1$ ms	1520 (1060)		A
V_{GES}		± 20		V
$T_{vj} (T_{stg})$	$T_{OPERATION} \leq T_{stg}$	- 40 ... +150 (125)		°C
V_{isol}	AC, 1 min.	4000		V
Inverse diode				
$I_F = - I_C$	$T_c = 25 (80)^\circ\text{C}$	720 (500)		A
I_{FRM}	$T_c = 25 (80)^\circ\text{C}$, $t_p = 1$ ms	1520 (1060)		A
I_{FSM}	$t_p = 10$ ms; sin.; $T_j = 150^\circ\text{C}$	5000		A

Characteristics		$T_{case} = 25^\circ\text{C}$, unless otherwise specified		
Symbol	Conditions	min.	typ.	max.
IGBT				
$V_{GE(th)}$	$V_{GE} = V_{CE}$, $I_C = 24$ mA	4,5	5,5	6,5
I_{CES}	$V_{GE} = 0$, $V_{CE} = V_{CES}$, $T_j = 25 (125)^\circ\text{C}$		0,2	0,6
$V_{CE(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1,5 (1,7)	1,75 (1,3)
r_{CE}	$V_{GE} = 15$ V, $T_j = 25 (125)^\circ\text{C}$		2,8 (3,8)	3,3 (5,4)
$V_{CE(sat)}$	$I_C = 600$ A, $V_{GE} = 15$ V, chip level		3,2 (4)	3,75 (4,55)
C_{ies}	under following conditions		37	nF
C_{oes}	$V_{GE} = 0$, $V_{CE} = 25$ V, $f = 1$ MHz		5,6	nF
C_{res}			2,8	nF
L_{CE}				20 nH
$R_{CC+EE'}$	res., terminal-chip $T_c = 25 (125)^\circ\text{C}$		0,18 (0,22)	mΩ
$t_{d(on)}$	$V_{CC} = 600$ V, $I_C = 600$ A			ns
t_r	$R_{Gon} = R_{Goff} = \Omega$, $T_j = 125^\circ\text{C}$			ns
$t_{d(off)}$	$V_{GE} \pm 15$ V			ns
t_f				ns
$E_{on} (E_{off})$			52 (26)	mJ
Inverse diode				
$V_F = V_{EC}$	$I_F = 600$ A; $V_{GE} = 0$ V; $T_j = 25 (125)^\circ\text{C}$		2,3 (2,1)	2,5 (2,3)
$V_{(TO)}$	$T_j = 25 (125)^\circ\text{C}$		1,1 (0,9)	1,3 (1,05)
r_T	$T_j = 25 (125)^\circ\text{C}$		2 (2)	2 (2,1)
I_{RRM}	$I_F = 600$ A; $T_j = 25 (125)^\circ\text{C}$			mΩ
Q_{rr}	$di/dt = A/\mu\text{s}$			A
E_{rr}	$V_{GE} = 0$ V			μC
				mJ
Thermal characteristics				
$R_{th(j-c)}$	per IGBT		0,03	K/W
$R_{th(j-c)D}$	per Inverse Diode		0,07	K/W
$R_{th(c-s)}$	per module		0,038	K/W
Mechanical data				
M_s	to heatsink M6	3	5	Nm
M_t	to terminals (M6(M4))	2,5 (1,1)	5 (2)	Nm
w			330	g





This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.